CLAIMS

A method to reduce the warpage effect which is induced by light in polyolefin
polymers comprising the steps of combining in the polyolefin polymer at least one
organic pigment and at least one sterically hindered piperidine derivative
(HA(L)S) selected from the group consisting of the formulae (Ia) – (Ic)

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Reaction products of

- in which, independently of each other,
 - A is -O- or -NR'-,
 - R' H, C1-C18-alkyl or one of the groups

$$\begin{bmatrix} C_1 \text{-} C_{18} \text{ Alkylen} & & & \\ R_1 & & & \\ R_2 & & & \\ \end{bmatrix}_{1-12} \text{R"} \quad -C_1 \text{-} C_{18} \text{ Alkylen} \\ \begin{bmatrix} R_1 & & \\ &$$

R" H or C₁-C₁₈-alkyl,

R" H, an aliphatic, cycloaliphatic, aromatic or heteroaromatic rest,

 R_1 $\,$ $\,$ $C_1\text{-}C_{18}\text{-alkyl},$ or two R_1 bound to the common carbon atom represent a $C_4\text{-}$ $\,$ $C_8\text{-cycloalkyl rest,}$

R2 H, C1-C18-alkyl or C7-C18-alkylaryl,

R₃ H, an aliphatic, cycloaliphatic, aromatic or heteroaromatic rest with n bounds.

R₄ C₁-C₁₈-alkyl or -C(O)-C₁-C₁₈-alkyl;

R₅ H, C₁-C₁₈-alkyl, C₄-C₁₈-cycloalkyl or two R₅ bound to the common carbon atom represent a C₄-C₈-cycloalkyl rest,

n is an integer > 0

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 The method according to claim 1 wherein 0.001% to 2.0% by weight of one or several organic pigments and 0.001% to 2.0% by weight of sterically hindered piperidine derivatives HA(L)S, based on the weight of polymer, are combined.

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3. The method according to claim 1 wherein the polyolefin polymer is selected from poly-propylene (PP), high density polyethylene (HDPE), polyethylene of high density and high molar mass (HDPE-HMW), polyethylene of high density and ultrahigh molar mass (HDPE-UHMW), medium density polyethylene (HMDPE), low density polyethylene (LDPE), linear low density polyethylene (LLDPE), branched low density polyethylene (BLDPE) and structurally related copolymers and polymer blends.

4. The method according to claim 1 further comprising the steps of combining with the composition of claim 1 one or more additives selected from the group of UV absorbers, processing stabilisers, phenol-type antioxidants and acid scavengers.

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- The method according to claim 4 wherein the UV absorber is preferably selected from 2-hydroxybenzophenones and 2-(2-hydroxyphenyl)benzotriazoles.
- 10 6. The method according to claim 4 wherein the processing stabiliser is preferably selected from organophosphite type or organophosphonite type stabilisers, most preferably tris(2,4-di-tert.-butylphenyl)phosphite or tetrakis-(2,4-di-tert.-butylphenyl)-biphenylene-diphosphonite.

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 The method according to claim 4 wherein the phenol-type antioxidant is preferably tetrakismethylene(3,5-di-tert.butyl-4-hydroxyphenyl)-hydrocinnamate and octadecyl 3,5-di-tert-butyl-4-hydroxyhydrocinnamate

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- The method according to claim 4 wherein the acid scavenger is preferably selected from metal stearates, most preferably zinc stearate or calcium stearate.
- 25 9. The method according to claim 4 wherein each of the further additive independently is present in an amount from 0.02 to 0.2 wt%, preferably in an amount from 0.05 to 0.1 wt%.
- 30 10. A polyolefine polymer article comprising a combination of at least one organic pigment and at least one sterically hindered piperidine derivative (HA(L)S) as obtained by the method of claims 1 to 9.